SUPER®

SUPER P4SCA
SUPER P4SCE

USER'S MANUAL

Revision 1.1

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About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPER P4SCA/P4SCE motherboard. The P4SCA/P4SCE supports single Intel Pentium® 4 processors or Intel Celeron processors up to 3.06 GHz (with Hyper Threading) at a system bus speed of 800/533/400 MHz.(*see the note below). Pentium 4/ Celeron processors are housed in a 478-pin micro PGA (Plastic Grid Array) package. Please refer to the motherboard specifications pages on our web site (http://www.supermicro.com/Product_page/product-m.htm) for updates on supported processors. This product is intended to be professionally installed.
(*Note: The above CPUs must be utilizing 0.13 Micron Manufacturing Technology)

Manual Organization

Chapter 1 includes a checklist of what should be included in your mainboard box, describes the features, specifications and performance of the P4SCA/P4SCE mainboard and provides detailed information about the chipset.

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when installing the processor and DDR memory modules and when mounting the mainboard in the chassis. Also refer to this chapter to connect the floppy and hard disk drives, the IDE interfaces, the parallel and serial ports, the mouse and keyboard and the twisted wires for the power supply, the reset button, the keylock/power LED and the speaker.It also details the installation of Intel ICH5R SATA RAID Utility and other software programs.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for the video, the memory and the setup configuration stored in CMOS. For quick reference, a general FAQ (Frequently Asked Questions) section is provided. Instructions are also included for contacting technical support. In addition, you can visit our web site at www.supermicro.com/techsupport.htm for more detailed information.

Chapter 4 includes an introduction to BIOS and provides detailed information on running the CMOS Setup utility.

Appendix A provides BIOS POST Messages.

Appendix B lists BIOS POST Codes.

Appendix C Installing the Operating System and Software Programs.

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Chapter 1
Introduction

1-1 Overview

Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

Please check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

All Included with Retail Box Only

One (1) Supermicro Mainboard

One (1) ATA 100/66 ribbon cable for IDE devices

Two (2) SATA cables

One (1) floppy drive ribbon cable

One (1) COM Port with Bracket

One (1) USB 4-port cable

One (1) I/O shield

One (1)CPU Retention Kit

One (1) Supermicro CD or diskettes containing drivers and utilities

One (1) User's/BIOS Manual

Contacting Supermicro

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Notes

SUPER P4SCA

Figure 1-1. SUPER P4SCA Image

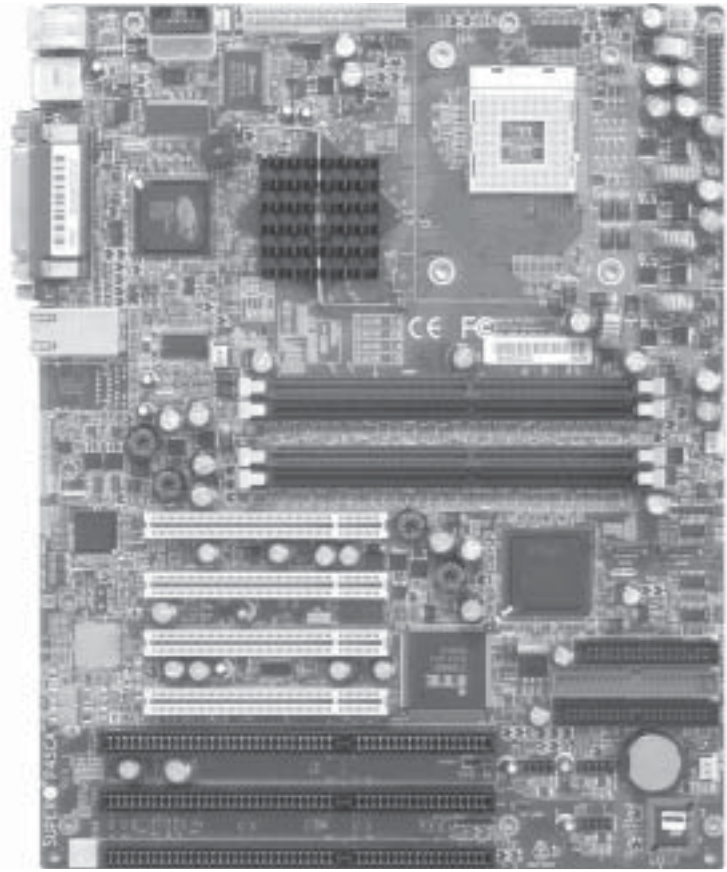
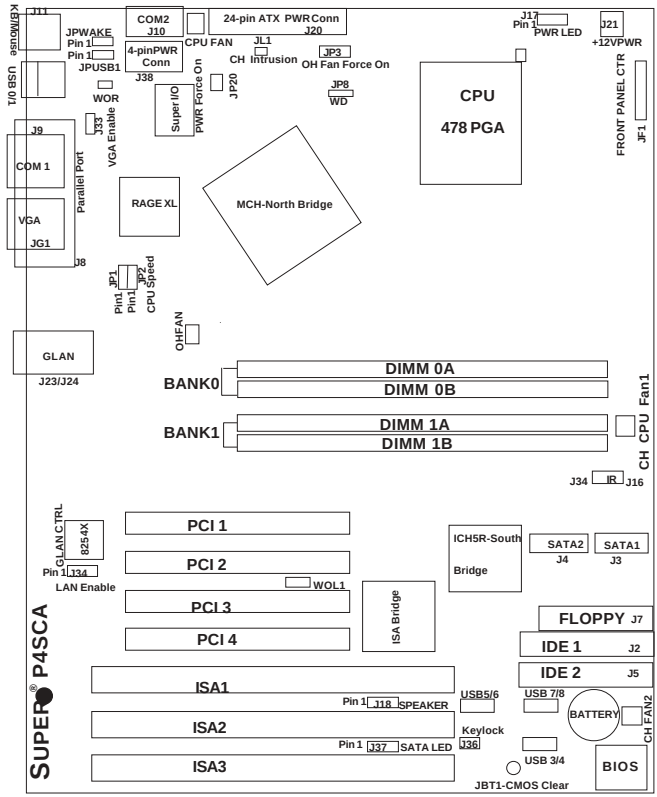


Figure 1-2. SUPER P4SCA Motherboard Layout
(not drawn to scale)



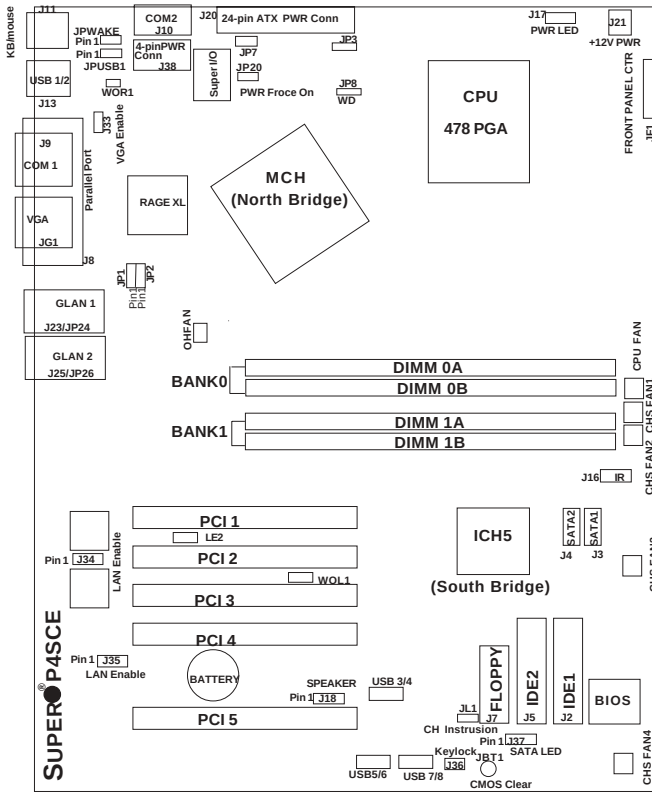
See Chapter 2 for detailed information on jumpers, I/O ports and JF1front panel connections.

Jumpers not indicated are for test purposes only.

SUPER P4SCE

Figure 1-3. SUPER P4SCE Image

Figure 1-4. SUPER P4SCE Motherboard Layout



See Chapter 2 for detailed information on jumpers, I/O ports and JF1front panel connections.

Jumpers not indicated are for test purposes only.

P4SCA/P4SCE Quick Reference

Jumpers	Description	Default Setting
J18	Speaker	Pins 3-4 (Internal Buzzer)
J33	VGA Enable/Disable	Pins 1-2 (Enabled)
J34/J35	GLAN1/GLAN2	Pins 1-2 (Enabled)
JBT1	CMOS Clear	See Section 2-7
JP1, JP2	CPU Clock Speed	Pins 1-2 (Auto)
JP3	OHFan Force On	Closed (On)
JP8	Watch Dog Reset	Pins 1-2 (WD Reset)
JP17	Power LED	Closed (On)
JP20	Power Force On	Open (Disabled)
JPUSB1	USB1/2 Wake Up	Pins 1-2 (Disabled)
JPWAKE	KB/Mouse PWOn Standby	Pins 1-2 (Disabled)

Connectors	Description
Chassis Fan1/2//3/4	CHS Fan Headers (*CHS Fan 3/4-P4SCE only. CHS Fan 3/4-Not monitored by BIOS)
CPU/OH FAN	CPU/Overhead Fan Headers
DIMM0A/0B/1A/1B	Memory (DIMM) Slots (1 through 4)
GLAN1/GLAN2	Gigabit LAN (Ethernet Ports)(*GLAN2-P4SCE)
J2, J5	IDE Ports (J2: IDE1, J5:IDE2)
J3, J4	Serial ATA Connectors (J3:SATA1, J4:SATA2)
J7	Floppy Disk Drive Connector
J8	Parallel Printer Port
J9,J10	COM1(J9), COM2(J10)
J11	Keyboard/Mouse Connector
J16	Infrared
J17	Power LED
J20	ATX Power Connector
J21	+12V Power Connector
J33	VGA Enable
J34, J35	LAN Enable (J34:LAN1, *J35: LAN-P4SCE)
J36	Keylock Header (*Open:Disabled-Default)
J37	Serial ATA LED (Pin1: SATA1, Pin2: SATA2)
J38	4-Pin Power Connector
JF1	Front Control Panel
JL1	Chassis Intrusion Header
LE2	Standby Power LED
USB 1/2	Universal Serial Ports 1/2
USB 3/4/5/6/7/8	Universal Serial Headers
WOL	Wake-On-LAN
WOR	Wake-On-Ring Header

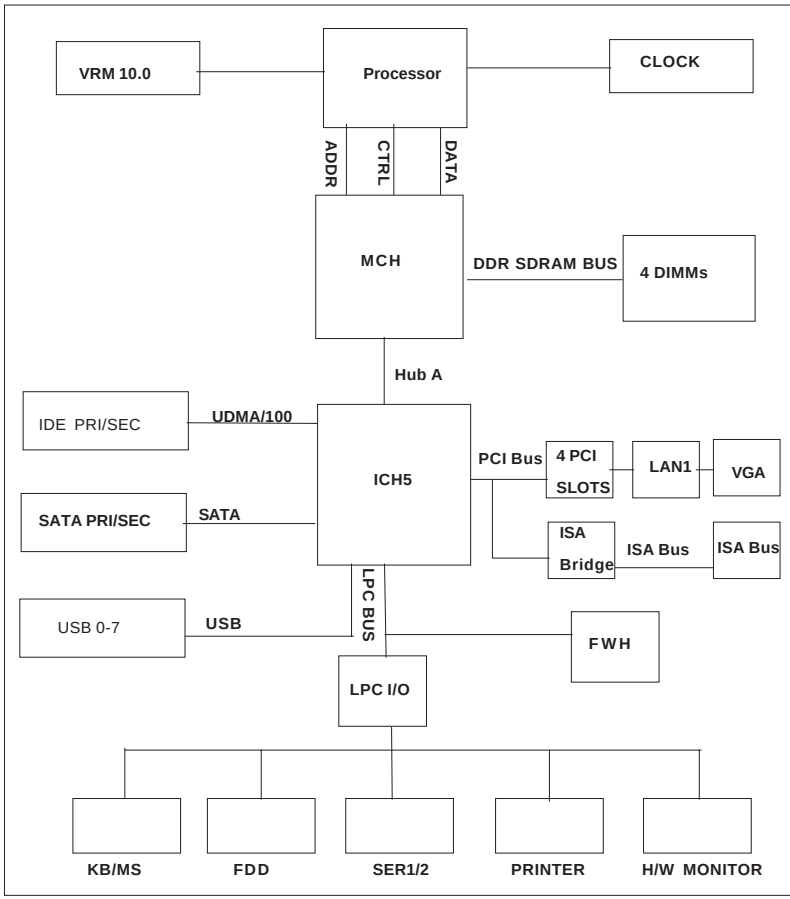


Figure 1-5.
P4SCA System Block Diagram: (with the 875 Canterwood Chipset)

Note: This is a general block diagram and may not exactly represent the features on your motherboard. See the following pages for the actual specifications of each motherboard.

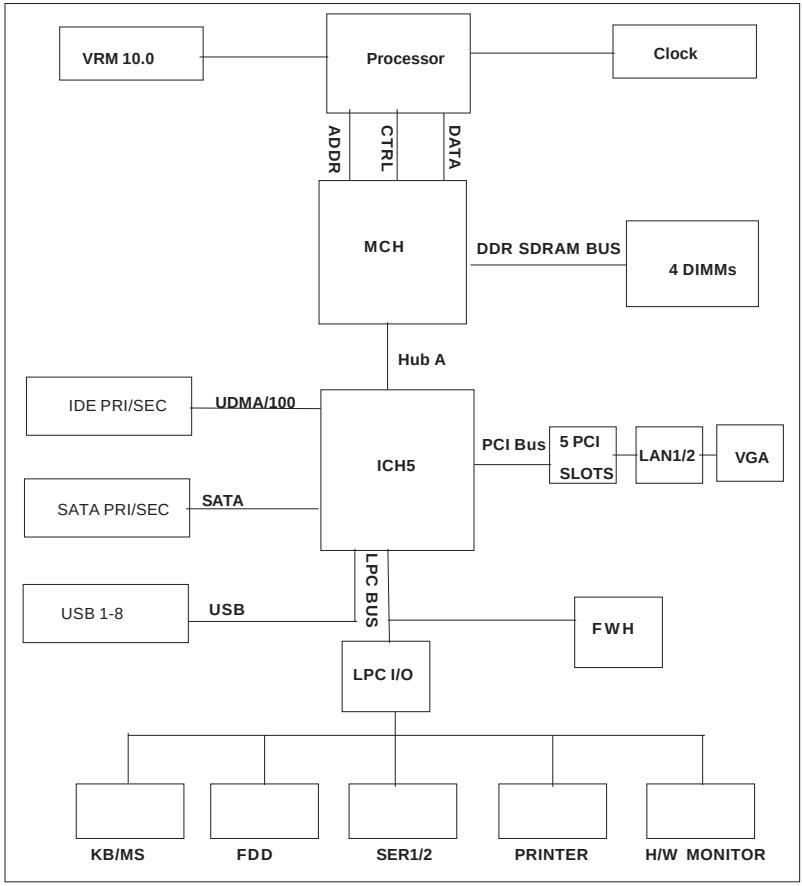


Figure 1-6.
P4SCE System Block Diagram: (with the 875 Canterwood Chipset)

Note: This is a general block diagram and may not exactly represent the features on your motherboard. See the following pages for the actual specifications of each motherboard.

Motherboard Features

CPU ◆ *Latest CPU technology!*

- Single Pentium® 4 478-pin PGA processors or Intel Celeron processors up to up to 3.06 GHz (at a 800/533/400 MHz FSB) w/Hyper Threading.
- Intel Pentium 4/Celeron processors (*use 0.13 Micron Manufacturing Technology CPUs)

Note: Refer to the motherboard specifications pages on our web site (http://www.supermicro.com/Product_page/product-m.htm) for updates on supported processors.

Memory ◆ Latest memory technology!

- Dual Channel DDR up to 4 GB ECC, non-ECC, unbuffered DDR-400/333/266 SDRAM in 2 Banks 4 DIMMs (*For Dual-Channel operation, identical pair(s) of memory modules must be populated in DIMM0A, DIMM1A and/or DIMM0B, DIMM1B.). (*See Section 2-4 for more details)
- *Intel Performance Acceleration Technology!*

Chipset ◆ *Latest Intel chipset technology!*

- Intel 875 Canterwood

Expansion Slots

(P4SCA)

- Four 32-bit, 33 MHz PCI slots (5V)
- Three ISA slots (5V)

(P4SCE)

- Five 32-bit, 33 MHz PCI slots (5V)

BIOS

- 4 Mb Firmware Hub AwardBIOS® Flash BIOS
- APM 1.2, DMI 2.3, PCI 2.3, ACPI 1.0, Plug and Play (PnP)

PC Health Monitoring

- Eight onboard voltage monitors for CPU core, +3.3V, +3.3V standby, +5V, +5V standby, Vbat (battery voltage) and ±12V
- Fan status monitor with firmware/software on/off control
- SuperDoctor II, Watch Dog, NMI, LDCM, LDSM (*optional)
- Environmental temperature monitoring and control
- Power-up mode control for recovery from AC power loss
- System overheat LED and control
- System resource alert
- Hardware BIOS virus protection
- Auto-switching voltage regulator for the CPU core

ACPI Features

- Microsoft OnNow
- Slow blinking LED for suspend state indicator
- BIOS support for USB keyboard
- Main switch override mechanism
- Internal/external modem ring-on

Onboard I/O

- 2 ATA100/66 EIDE Channels for a total of 4 IDE devices backward compatible
- Intel ICH5R SATA Controller, 2 connectors for 2 devices
- 1 floppy port interface (up to 2.88 MB)
- 2 Fast UART 16550 compatible serial ports
- Intel 82541Gigabit Ethernet Controller (33 MHz)
- 1 EPP (Enhanced Parallel Port) and ECP (Extended Capabilities Port) supported parallel port
- PS/2 mouse and PS/2 keyboard ports
- Up to 8 USB (Universal Serial Bus) 2.0 ports for a speed of up to 480Mbps ◆ *Latest USB 2.0 technology!*
- 1 infrared port

Other

- Hyper-threading enabled
- Wake-on-LAN (WOL)
- Wake-on-Ring (WOR)
- Multiple CPU clock frequency ratio selections (set in BIOS)
- Suspend-to-RAM
- Onboard +5vsb warning LED ("LE2")
- CPU Thermal Trip support for Processor Protection

CD Utilities

- BIOS flash upgrade utility
- Drivers and software for Intel 875 Canterwood chipset utilities

Dimensions

- ATX form factor, 12" x 9.5" (305 x 241.3 mm)

1-2 Chipset Overview (Intel's 875 Canterwood Chipset)

Intel's 875 Canterwood Chipset contains the following main components: the 875 Canterwood Memory Controller Hub (MCH) and the I/O Controller Hub 5(ICH5R). These two components are interconnected via Hub Interface.

Memory Controller Hub (MCH)

The 875 Canterwood Memory Controller Hub (MCH) is designed to support Intel PGA 478-pin Processors. The function of the 875 Canterwood MCH is to arbitrate the flow of data transfer between system bus (FSB), system memory, and Hub Interface. The Canterwood MCH supports 800 MHz FSB, 400/333 Memory Interface, 533 MHz FSB, 333/266 Memory Interface, and 400 MHz FSB 266 MHz Memory Interface.

System Memory Interface

The 875 Canterwood Memory Controller (MCH) supports two 64-bit wide DDR data channels with bandwidth up to 6.4 GB/s (DDR400) in dual channel mode. It supports 128-Mb, 256-Mb,512-Mb, x8, X16 DDR. Maximum system memory supports up to 4.0 GB for Dual-Channel. ECC/Non ECC unbuffered DDR DIMMs are supported, but it does not support registered, mixed-mode DIMMs.

Intel ICH5R System Features

The I/O Controller Hub provides the I/O subsystem with access to the rest of the system. It supports 2-channel Ultra ATA/100 Bus Master IDE Controller, two Serial ATA (SATA) Host Controllers, SMBus 2.0 Controller, LPC/ Flash BIOS Interface, PCI 2.3 Interface, and Integrated System Management Controller.

1-3 PC Health Monitoring

This section describes the PC health monitoring features of the SUPER P4SCA/P4SCE. The motherboard has an onboard System Hardware Monitor chip that supports PC health monitoring.

Eight Onboard Voltage Monitors for the CPU Core, +3.3V, +3.3V standby, +5V, +5V standby, Vbat and ±12V

The onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, it will give a warning or send an error message to the screen, using Supermicro's Monitoring Software-Super O Doctor.

Fan Status Monitor with Firmware/Software On/Off Control

The PC health monitor can check the RPM status of the cooling fans. The onboard 3-pin fans are controlled by the power management functions.

Environmental Temperature Control

The P4SCA/P4SCE has a CPU "thermal trip" feature. A thermal control sensor monitors the CPU temperature in real time and will send a signal to shut down the system whenever the CPU temperature exceeds a certain threshold. This works to protect the CPU from being damaged by overheating.

CPU Overheat LED and Control

This feature is available when the user enables the CPU overheat warning function in the BIOS. This allows the user to define an overheat temperature. When this temperature is exceeded, the CPU thermal trip feature will activate and shut down the system.

Hardware BIOS Virus Protection

The system BIOS is protected by hardware so that no virus can infect the BIOS area. The user can only change the BIOS content through the flash utility provided by Supermicro. This feature can prevent viruses from infecting the BIOS area and destroying valuable data.

Auto-Switching Voltage Regulator for the CPU Core

The 3-phase-switching voltage regulator for the CPU core can support up to 60A current and auto-sense voltage IDs ranging from 1.1V to 1.85V. This will allow the regulator to run cooler and thus make the system more stable.

1-4 Power Configuration Settings

This section describes features of your motherboard that deal with power and power settings.

Microsoft OnNow

The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears to be off and responds immediately to user or other requests.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

BIOS Support for USB Keyboard

If the USB keyboard is the only keyboard in the system, it keyboard will function like a normal keyboard during system boot-up.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button. When the user depresses the power button, the system will enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Depressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just depress and hold the power button for 4 seconds. The power will turn off and no power will be provided to the motherboard.

Wake-On-Ring (WOR) Header

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the SoftOff state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

Wake-On-LAN (WOL)

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, updates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboards have a 3-pin header (WOL) to connect to the 3-pin header on a Network Interface Card (NIC) that has WOL capability. Note that Wake-On-Lan can only be used with an ATX 2.01 (or above) compliant power supply.

1-5 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates of 1 GHz and faster.

The SUPER P4SCA/P4SCE accommodates 12V ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. You power supply must supply 1 amp of 5V standby voltage.

It is strongly recommended that you use a high quality power supply that meets 12V ATX power supply Specification 1.1 or above. Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

It also provides two high-speed, 16550 compatible serial communication ports (UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through a SMI or SCI function pin. It also features auto power management to reduce power consumption.

The IRQs, DMAs and I/O space resources of the Super I/O can be flexibly adjusted to meet ISA PnP requirements, which support ACPI and APM (Advanced Power Management).

1-6 Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports four 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s.

Chapter 2
Installation

2-1 Static-Sensitive Devices

Electric Static Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Installation Procedures

Follow the procedures as listed below for full installation of the motherboard into a chassis:

1. Install the processor and the heatsink to the motherboard.

2. Install the motherboard in the chassis.

3. Install the memory and add-on cards.

4. Finally, connect the cables and install the drivers.

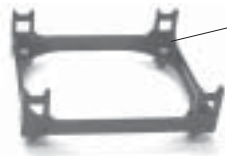
2-2 Processor and Heatsink Fan Installation

When handling the processor package, avoid placing direct pressure on the label area of the fan.

IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

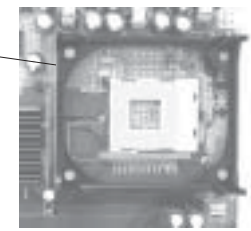
Installation of the Processor and Heatsink

1. Locate the following components, which are included in the shipping package.



If you buy a boxed Intel Pentium 4 478 processor, it should include a heatsink, fan and retention mechanism. If you buy a processor separately, use only a Supermicro or Intel certified heatsink and fan.

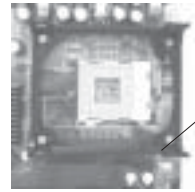
2. Insert the white pegs into the black anchors. Do not force the white pegs all the way in - about 1/3 of the white pegs should be inside the black anchors. (These are for chassis that do not have four CPU retention holes.)

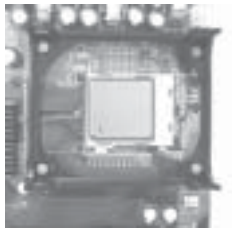


3. Place a retention bracket in the proper position and secure it by pressing two pegs into the retention holes until you hear a *click*. The clicking sound indicates that the peg is locked and secured.

4. Secure the other retention bracket into position by repeating Step 3.

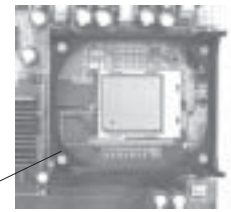
5. Lift the lever on the CPU socket.





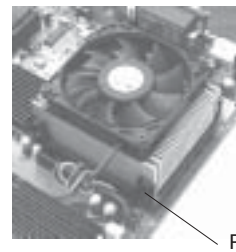
6. Install the CPU in the socket. Make sure that Pin 1 of the CPU is seated on Pin 1 of the socket (both corners are marked with a triangle).

7. Press the lever down until you hear it *click* into the locked position.



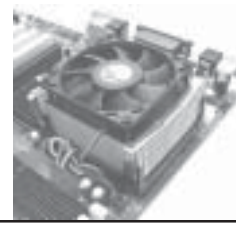
8. Apply the proper amount of thermal compound to the CPU die.

9. Place the heatsink on top of the CPU and press firmly downward - do not twist or slide the heatsink to seat thermal compound.



10. Secure the heat sink by locking the retention clips into their proper position.

11. Connect the CPU fan cable to the CPU Fan header on the motherboard.



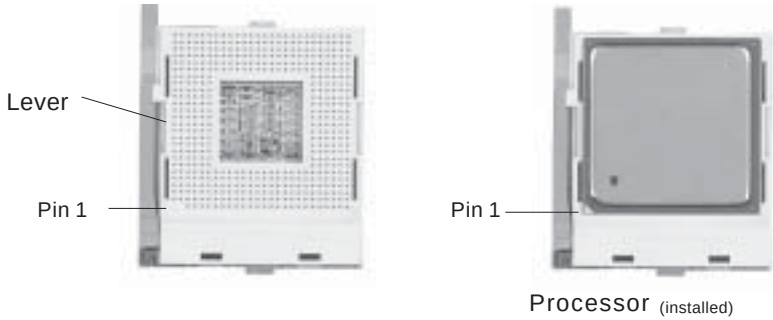


Figure 2-1. 478-pin mPGA Socket: Empty and with Processor Installed

2-3 Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. Make sure the location of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray.

2-4 Installing DDR Memory

CAUTION

Exercise extreme care when installing or removing memory modules to prevent any possible damage.

Memory Module Installation (See Figure 2-2)

1. Insert each DDR memory module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the module incorrectly. (See support information below.)
2. Gently press down on the memory module until it snaps into place.

Support

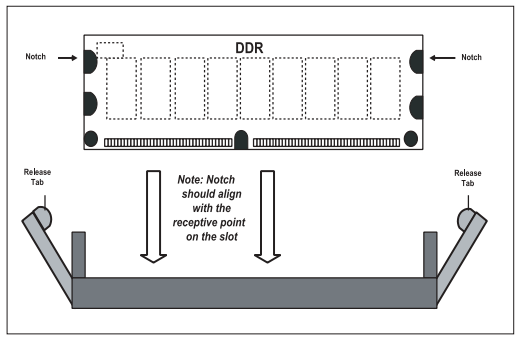
The P4SCA/P4SCE supports Dual channel, ECC/non-ECC, unbuffered DDR-400/333/266 DDR SDRAM. (Populate DIMM0A,DIMM1A and/or DIMM0B, DIMM1B with memory modules of the same size/same type will result in the dual channel, two-way interleaved memory which is faster than the single channel memory.

Memory Speeds			
Host Clock (MHz)	**FSB (MHz)**	**DRAM DATA RATE (MT/s)**	**Shown during POST**
100	400	266	DDR266
		333	DDR266
		400	DDR266
133	533	266	DDR266
		333	DDR333
		400	DDR333
200	800	266	DDR266
		333	DDR320 (*Note)
		400	DDR400

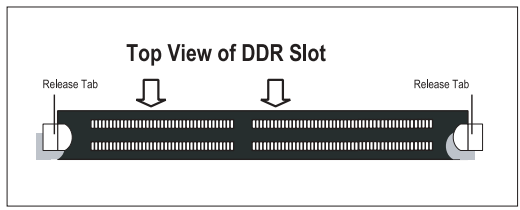
(*Note: The BIOS will display 320 due to the limitation of Intel's chipset).

Figure 2-2. Side and Top Views of DDR Module Installation into Slot

To Install:
Insert module vertically and press down until it snaps into place. Pay attention to the notch.



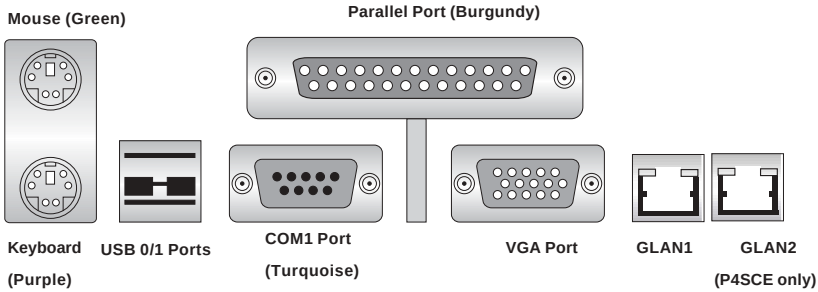
To Remove:
Use your thumbs gently to push each release tab outward to release the DIMM from the slot.



2-5 I/O Port/Control Panel Connector Locations

The I/O ports are color coded in conformance with the PC99 specification to make setting up your system easier. See Figure 2-3 below for the colors and locations of the various IO ports.

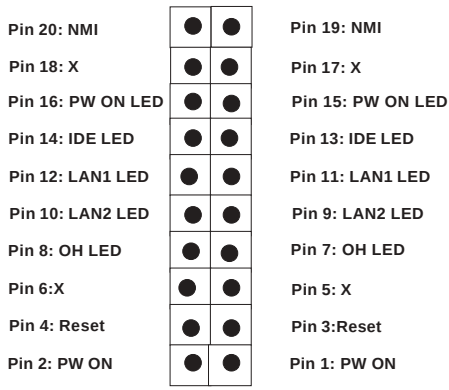
Figure 2-3. I/O Port Locations and Definitions



Front Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 2-4 for the pin definitions of the various connectors including the speaker. Refer to Section 2-6 for details.

Figure 2-4. Front Control Panel Connectors



2-6 Connecting Cables

Power Supply Connectors

The primary power supply connector (J20) on the P4SCA/ P4SCE meets the SSI (Superset ATX) 24-pin specification. Refer to the table on the right for the pin definitions of the ATX 20-pin power connector. You must also connect the 4-pin (J21) processor power connector to your power supply. Refer to the table below right for the J21 (12V) connector. If J21 is not accessible, there is another 4-pin power connector (J38) available on the motherboard. J38 is located close to the ATX PWR Connector and next to the COM2 port. See the table on the right for the pin definition. (*You must use either J38 or J21 for CPU Power.)

ATX Power Supply 24-pin Connector Pin Definitions (J20)

Pin Number	Definition	Pin Number	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON#	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res(NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

+12V 4-pin Connector (J21)

Required Connection

Pins #	Definition
1 & 2	Ground
3 & 4	+12 V

+12V 4-pin Connector (J38)

Additional Connection

Pins #	Definition
1	+12V
2 & 3	Ground
4	NC

(*Note: For CPU Power, you must use either J21 or J38)

IR Connector

The infrared connector is located on J16. See the table on the right for pin definitions. See the Technical Support section of our web page for information on the infrared devices you can connect to the system.

Infrared Pin Definitions (J16)

Pin Number	Definition
1	+5V
2	CIRRX
3	IRRX
4	Ground
5	IRTX
6	NC

PW_ON Connector

The PW_ON connector is located on pins 1 and 2 of JF1.

PW_ON Pin Definitions (JF1)

Pin Number	Definition
1	PW_ON
2	+3V

Reset Connector

The reset connector is located on pins 3 and 4 of JF1. This connector attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Pin Definitions (JF1)

Pin Number	Definition
3	Reset
4	Ground

*IDE/SATA LED (*See the note below)

The IDE/SATA LED is located on pins 7, 8 of JF1. This connects to the hard drive LED to display all IDE and SATA activities. See the table on the right for pin definitions.

(*Note: This LED is for all IDE and SATA devices)

IDE Pin Definition

Pin Number	Definition
7	+5V
8	HD Active

Power_LED Connector

The Power LED connector is located on pins 15, 16 of JF1. (*Use J17 for a 3-pin connector.) This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

J17 Pin Definitions

Pin Number	Definition
1	+5V
2	Key
3	Ground

Power_LED Pin Definitions (JF1)

Pin Number	Definition
15	+5V
16	Ground

Speaker Connector

The speaker connector is located on J18. See the table on the right for pin definitions.

Speaker: Pin Definition

Fucntion	Pin Definition
Pins 1, 4	External Speaker
Pins 3, 4	Internal Speaker

Serial Ports

Two serial ports are included on the motherboard: COM1 is a port located beside the mouse/keyboard ports and COM2 is a header located on the motherboard near J20 (Power Connector). See the table on the right for pin definitions.

*NC indicates no connection.

Serial Port Pin Definitions (COM1, COM2)

Pin Number	Definition	Pin Number	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: Pin 10 is included on the header but not on the port.

Fan Headers

There are four fan headers on the P4SCA, which are designated CPU Fan, Chassis Fan 1, Chassis Fan 2 and Over Heat Fan. There are six fans on the P4SCE, which are designated CPU Fan, Chassis Fan 1, Chassis Fan 2,Chassis Fan 3, Chassis Fan 4 and Over Heat Fan. (Chassis Fan 3 and Chassis Fan 4 are not monitored by BIOS.) Connect the fan on your CPU heatsink to the CPU Fan header. See the table on the right for pin definitions.

Fan Header Pin Definitions (CPU, Chassis and Overheat)

Pin Number	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer

Caution: These fan headers are DC power.

Chassis Intrusion

The Chassis Intrusion header is designated JL1. See the board layout in Chapter 1 for the location of JL1 and the table on the right for pin definitions.

Chassis Intrusion Pin Definitions (JL1)

Pin Number	Definition
1	Intrusion Input
2	Ground

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on J1. See the table on the right for pin definitions. (The mouse port is above the keyboard port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions (J1)

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Universal Serial Bus (USB)

There are two Universal Serial Bus Connectors located on the I/O panel and additional six USB headers are located on the motherboard. These ports, labeled USB3 to USB8, can be used to provide front side chassis access (cables not included). See the tables on the right (below) for pin definitions.

USB Pin Definition

JPUSB

Pin#	Definition
1	+5V
2	P0-
3	P0+
4	Ground

USB 3/4/5/6/7/8

Pin Number	Definition	Pin Number	Definition
1	+5V	2	+5V
3	PO-	4	PO-
5	PO+	6	PO+
7	Ground	8	Ground
		10	Ground

Wake-On-LAN

The Wake-On-LAN header is designated WOL on the motherboard. See the table on the right for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this function. (You must also have a LAN card with a Wake-On-LAN connector and cable to use this feature.)

Wake-On-LAN Pin Definitions (WOL)

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is designated WOR. This function allows your computer to receive and be "awakened" by an incoming call when in the suspend state. See the table on the right for pin definitions. You must also have a WOR card and cable to use WOR.

Wake-On-Ring Pin Definitions (WOR)

Pin Number	Definition
1	Ground
2	Wake-up

SATA LED

The SATA LED header is located on J37. This header will display all SATA activities. See the table on the right for pin definitions.

SATA LED Pin Definitions (J37)

Pin Number	Definition
1	SATA1
2	SATA2
3	NC
4	NC
5	NC

Keylock Enabled/Disabled

The Keylock header is located on J36. Close Pin 1 and Pin 2 of J36 to enable the function of Keylock. The default setting is "Open". See the table on the right for pin definitions.

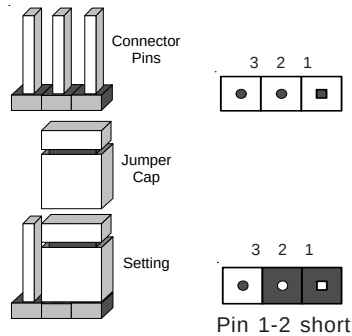
Keylock Enabled/Disabled (J36) Pin Definitions

Pin Definitions	Function
1 & 2 (closed)	Enabled
1 & 2 (Open)	Disabled

2-7 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.



Pin 1-2 short

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.

CMOS Clear

JBT1 is not actually a jumper but consists of two contact pads. To clear the contents of CMOS, short these pads together by touching them both with a metal conductor such as the head of a small screwdriver. **Note:** for ATX power supplies, you must completely shut down the system and remove the AC power cord before clearing CMOS.

USB Wake-Up (*USB1/2 Only)

Use JPUSB1 to enable or disable USB Wake-Up, which allows you to wakeup the system by depressing a key on the keyboard or by clicking the mouse when either is connected to the USB1 or USB2 port. Enable the jumper a to allow the system to be woken up from S1 and S3 in Windows OS. See the table on the right for jumper settings.

USB Wake-Up
Jumper Settings (JPUSB1)

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

Watch Dog Enable/Disable

JP8 enables controls the Watch Dog function. Watch Dog is a system monitor that takes action when a software application freezes the system. Pins 1-2 will have WD reset the system if a program freezes. Pins 2-3 will generate a non-maskable interrupt for the program that has frozen. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS. (*Note, when the function of Watch Dog is enabled, the user needs to write his own application software in order to disable the Watch Dog Timer.)

Watch Dog
Jumper Settings (JP8)

Jumper Position	Definition
Pins 1-2	WD to Reset
Pins 2-3	WD to NMI
Open	Disabled

Front Side Bus Speed

JP1, JP2 are used to set the system (front side) bus speed for the processors. It is best to keep this jumper set to Auto. This jumper is used together with the CPU Clock setting in BIOS. See the table on the right for jumper settings.

	JP1	JP2
Auto	1-2	1-2
100 MHz (x4)	2-3	2-3
133 MHz (x4)	NC	2-3
Reserved	NC	NC
200 MHz (x4)	2-3	NC

Keyboard Wake-Up

The JPWAKE jumper is used to allow the system to be woken up by depressing a key on the keyboard from S1 or S3 in Windows OS. See the table on the right for jumper settings. Your power supply must meet ATX specification 2.01 or higher and supply 720 mA of standby power to use this feature.

Keyboard Wake-Up Jumper Settings (JPWAKE)

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

LAN Enable/Disable

Change the setting of jumper J34, J35 (*P4SCE only) to enable or disable the onboard LAN on the motherboard. See the table on the right for jumper settings. The default setting is Enabled.

LAN Enable/Disable Jumper Settings (J34, J35)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

2-8 Parallel Port, Floppy Drive, Hard Drive and AGP Connections

Use the following information to connect the floppy and hard disk drive cables.

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.
- The 80-wire ATA100/66 IDE hard disk drive cable that came with your system has two connectors to support two drives. This special cable should be used to take advantage of the speed this new technology offers. The blue connector connects to the onboard IDE connector interface and the other connector(s) to your hard drive(s). Consult the documentation that came with your disk drive for details on actual jumper locations and settings for the hard disk drive.

Parallel Port Connector

The parallel port is located on J8. Refer to Figure 2-3 for location. See the table on the right for pin definitions.

Parallel (Printer) Port Pin Definitions (J8)

Pin Number	Function	Pin Number	Function
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

Floppy Connector

The floppy connector is located on J7. Refer to Figure 2-3 for location. See the table on the right for pin definitions.

Floppy Connector Pin Definitions (J7)

Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

IDE Connectors

You do not need to configure the onboard IDE interfaces (-Pins 13,14 of JF1.) Refer to Figure 2-3 for location. See the table on the left for pin definitions. **Note:** You must use the ATA100/66 cable included with your system to benefit from the ATA100/66 technology.

IDE Connector Pin Definitions (J2, J5)

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND

(*Note: Please see Appendix C for Software installation.)

Chapter 3
Troubleshooting

3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. Always disconnect the AC power cord before adding, changing or installing any hardware components.

Before Power On

1. Check that the +5v standby LED is not lit (LE2 on motherboard).
2. Make sure the 4-pin 12v power connector at J24 is connected to your power supply.
3. Make sure no short circuits exist between the motherboard and chassis.
4. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
5. Remove all add-on cards.
6. Install a CPU and heatsink (making sure it is fully seated) and connect the chassis speaker and the power LED to the motherboard. Check all jumper settings as well.

No Power

1. Make sure no short circuits exist between the motherboard and the chassis.
2. Verify that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on but you have no video, remove all the add-on cards and cables.
2. Use the speaker to determine if any beep codes exist. Refer to Appendix A for details on beep codes.

NOTE

If you are a system integrator, VAR or OEM, a POST diagnostics card is recommended. For I/O port 80h codes, refer to App. B.

Memory Errors

1. Make sure the DIMM modules are properly and fully installed.
2. You should be using unbuffered ECC/Non ECC DDR memory (see next page). Also, it is recommended that you use the same memory speed for all DIMMs in the system. See Section 2-4 for memory limitations.
3. Check for bad DIMM modules or slots by swapping modules between slots and noting the results.
4. Check the power supply voltage 115V/230V switch.

Losing the System's Setup Configuration

1. Ensure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 1-6 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, note that as a motherboard manufacturer, Supermicro does not sell directly to end-users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Questions' (FAQs) sections in this chapter or see the FAQs on our web site (http://www.supermicro.com/techsupport.htm) before contacting Technical Support.

2. BIOS upgrades can be downloaded from our web site at http://www.supermicro.com/techsupport/download.htm.

Note: Not all BIOS can be flashed depending on the modifications to the boot block code.

3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:
   - Motherboard model and PCB revision number
   - BIOS release date/version (this can be seen on the initial display when your system first boots up)
   - System configuration

   An example of a Technical Support form is posted on our web site at http://www.supermicro.com/techsupport/contact_support.htm.
4. Distributors: For immediate assistance, please have your account number ready when contacting our technical support department by e-mail at support@supermicro.com or by fax at (408) 503-8019.

3-3 Frequently Asked Questions

Question: What type of memory does my motherboard support?

Answer: The P4SCA/P4SCE supports up to 4 GB of ECC/non-ECC, **unbuffered** DDR-400/333/266, two-way interleaved SDRAM. See Section 2-4 for details on installing memory.

Question: How do I update my BIOS?

Answer: It is recommended that you **not** upgrade your BIOS if you are not experiencing problems with your system. Updated BIOS files are located on our web site at http://www.supermicro.com/techsupport/BIOS/bios.htm. Please check our BIOS warning message and the information on how to update your BIOS on our web site. Also, check the current BIOS revision and make sure it is newer than your current BIOS before downloading. Select your mainboard model and download the BIOS file to your computer. Unzip the BIOS update file and you will find the readme.txt (flash instructions), the awdflash.exe (BIOS flash utility) and the BIOS image (xxxx.bin) files. Copy these files onto a bootable floppy and reboot your system. It is not necessary to set the BIOS boot block protection jumpers on the mainboard. At the DOS prompt upon rebooting, enter the command "awdflash." Then type in the BIOS file that you want to update (xxxx.bin).

Question: What's on the CD that came with my motherboard?

Answer: The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for Windows and security and audio drivers.

Question: I see some of my PCI devices sharing IRQs, but the system seems to be fine. Is this correct or not?

Answer: Some PCI Bus Mastering devices can share IRQs without performance penalties. These devices are designed to work correctly while sharing IRQs. See Table 3-1, below, for details on shared IRQs.

Table 3-1. P4SCA/P4SCE IRQs

PCI 1 shares an IRQ with the USB 2.0 Controller, System Management Bus Controller, onboard VGA
PCI 2 shares an IRQ with a USB Controller (USB5/6)*, SATA, onboard VGA
PCI 3 shares an IRQ with a USB Controller (USB3/USB4)*, onboard VGA
PCI 4 shares an IRQ with LAN1 & LAN2
PCI 5 shares an IRQ with LAN1 & LAN2 (*P4SCE only)
ISA (1, 2, 3) share IRQ 14 with Primary IDE (*P4SCA only)
ISA (1, 2, 3) share IRQ 15 with Secondary IDE (*P4SCA only)

*Assumes USB 2.0 drivers have not been installed.

Question: How do I connect the ATA100/66 cable to my IDE device(s)?

Answer: The 80-wire/40-pin high-density ATA100/66 IDE cable that came with your system has two connectors to support two drives. This special cable must be used to take advantage of the speed the ATA100/66 technology offers. **Connect the blue connector to the onboard IDE header and the other connector(s) to your hard drive(s).** Consult the documentation that came with your disk drive for details on actual jumper locations and settings.

3-4 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

NOTES

Chapter 4
BIOS

4-1 Introduction

This chapter describes the AwardBIOS for the P4SCA/P4SCE. The Award ROM BIOS is stored in a Flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Refer to the Manual Download area of our web site for any changes to BIOS that are not reflected in this manual.

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The AwardBIOS Flash chip stores the system parameters, such as amount of memory, type of disk drives and video displays, etc. CMOS requires very little power. When the computer is turned off, a back-up battery provides power to the BIOS Flash chip, enabling it to retain the system parameters. Each time the computer is powered-on, the computer is then configured with the values stored in the BIOS ROM by the system BIOS, which gains control when the computer is powered on.

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Chipset and Power menus. Section 4-3 gives detailed descriptions of each parameter setting in the Setup utility.

4-2 Running Setup

Optimal default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the Main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).

When you first power on the computer, the AwardBIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after turning the system on, or
2. When the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Del> key to activate the Main Setup Menu.

Press DEL to enter SETUP

4-3 Main BIOS Setup

All Main Setup options are described in this section. The Main BIOS Setup screen is displayed below.

Use the <Up> <Down> arrow keys or the <Tab> key to move among the different settings in the above menu.

Press the <Esc> key to exit the CMOS Setup Menu and use the <Left> <Right> arrow keys to enter the other categories of BIOS settings. The next section is described in detail to illustrate how to navigate through the menus.